Font used: FantasqueSansM Nerd Font

Not made by OCR

Oxford Cambride and RSA

GCSE

Computer Science

Nightmare

Practise

Time allowed: 1 hour 30 minutes

NO calculator

Please read the following before starting the mock exam:

I recently found out that OCR are just commonly… weird across all / most their subjects.

You need to be able to answer extremely difficult questions regarding your quite easy content but with balance of referencing to the worldly scenario and using Computer Science terminology (aswell as unusual problem-solving for a Paper based on memorising concepts).

And you also aren't always safe with markscheme answers, as they can change during series of the same specification and so you really need to understand how your content corelates to real-life scenarios, which **sounds good but is terrible when on exam paper**.

This ISN'T A predicted paper, it is simply a fake paper from your nightmares to prepare you for whatever OCR does next.

The total mark for this paper is 110. [in a real exam, it would be out of 80.]

From exam:

Use black ink. You can use an HB pencil, but only for graphs and diagrams.

Write your answer to each question in the space provided.

Answer <u>all</u> the questions.

Quality of extended response will be assessed in questions marked with an asterisk (*)

Read each question carefully before you start your answer.

1 Below is a set of tables for you to complete.

a)

8 bit binary	Denary	Hexadecimal	Size to store this data in MB
10010101	149		
	20		
		2F	

Complete the above table, below is some space for working out.

[8 marks]

b) What is the **minimum** set of bits needed to represent the hexadecimal number 08E7F0 ?

[1 mark]

_____

_____

c) Why is 1 + 1 = 1 0 in the binary number system?

[2 marks]

_____

_____

d) Tick the statement that is true here regarding the field of Images.

[1 mark]

( ) An entire image file is always the size of width x height x colourdepth

( ) An image is represented as a series of bitmaps, representable in hexadecimal

( ) Images are suitable for lossy compression

( ) Images cannot be both large and good quality

Question 1 continues on the next side.

e) Represent a singular terrabyte in another unit that isn't the terabyte. Show your working out.

[2 marks]

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Total marks for Question 1 are 14 marks

2 The military is overhauling some certain aspects of their technology, including a server to store top secret data.

a) They are working on a new server.

They found that using SSL encryption can make it harder for unauthorised persons to be able to read the data in the case they intercept it in a man-in-the-middle attack.

How does encryption work here?

[3 marks]

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b) In the network, the lead engineer has decided to only use wires, however, a soldier argues the neccessity of wireless connections.

Explain the advantage and disadvantage of using **wireless** connections.

[4 marks]

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Question 2 continues on the next side.

c) * When deciding the software for the file management of their server, they decide to use an opensource project.

Discuss the positive and negative consequences of using an opensource software, including:
* Privacy issues
* Legal issues
* Ethical issues

[8 marks]

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Total marks for Question 2 are 15 marks

3 A student is comparing various types of “computers”, a calculator, their laptop, and a router.

a) When comparing the specifications of the calculator of their laptop with the calculator, they find the calculator has a 40 Mhz clock speed CPU, while their laptop had a 3.2 Ghz clock speed CPU with two cores.
What does this suggest about the calculator?

[3 marks]

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Question 3 continues on the next side.

b) A router is a device that transfers data packets between networks

State two other properties of a router.

[2 marks]

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c) What device that isn't a general purpose computer can be connected to a router? Name one example.

[1 mark]

_____

_____

d) Fill in the blanks regarding the laptop using the below word bank. Not all words have to be used and you may use a word more than once.

[7 marks]

Many Secondary-Storage MAR RAM ROM MDR Primary-Storage CPU bootstrap Von-Neumman BIOS Games Programs Tasks Binary Havard

A laptop is a general purpose computer as it is a machine that can be used for _____ purposes such as web-browsing, gaming. The laptop contains a CPU which is connected to two types of _____ : RAM and ROM. ROM stores the _____, something that RAM doesn't hold, rather it holds instructions in _____. The _____ is such a component of the _____ that stores the instruction fetched as a result of the address stored in the MAR before it is decoded by the CU. Due to the nature of it being as specified above, a stored-program computer, it is considered to be of the _____ architecture.

e) Over time, the student complains about slow speeds from their computer, and they want to store their data in a way that it takes up less space than normal without losing any accuracy.

State first the Utility software needed to achieve this, and secondly the specific type of algorithm that should be used on his files.

[2 marks]

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Total marks for Question 3 are 15 marks

4 A hospital is bringing about computers in order to store data in an easier manner and keep track of patients records.

a) Draw in the space below a diagram of a star network containing:
A Peer-to-peer connection
Three PC's
A printer
A switch

[4 marks]

b) An IT assistant suggests that a mesh network is too vulnerable to attacks from colleagues.

Explain why this is so.

[2 marks]

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c) The hospital eventually completes their network.

This is an example of a LAN or a WAN? Explain why.

[3 marks]

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Question 4 continues on the next side.

d) The hospital has decided to use a client-server model now.

Explain the advantages of having such a model **over** peer to peer.

[5 marks]

e) Staff, while using email, have noticed that emails suddenly dissapear after having had viewed it on one of their devices.

State firstly the current protocol in use, secondly what it should be replaced with, and thirdly the reason why this is so.

[4 marks]

f) One other staff, while using a HTTPS site, weirdly finds out they have found themselves on a HTTP site that looks like the same legitimate site while browsing only that site.

State / suggest a form of attack used here.

[1 mark]

Question 4 continues on the next side.

g) One IT technician runs defragmentation on all computers in an attempt to resolve complaints about speed when accessing files.

i. How does this scenario support the use of a client-server model?
[2 marks]

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ii. The defragmentation software does not make any improvement, as it turns out the computers were using an SSD as a form of secondary storage.

Why does this affect the impact of defragmentation software?
[2 marks]

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iii What other factors could affect performance of computers?
State 3 alternative answers.
[3 marks]

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Total marks for Question 4 are 23 marks

5 A writer is writing an article on their computer.

a) i. Their document file type is using the ASCII character set.

What does the acronym “ASCII” stand for?

[2 marks]

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ii. ASCII uses 7 bits, although is encoded with an extra bit to ensure no data corruption has occurred.

State two other character representations aswell as the amount of bits they use.

[4 marks]

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b) Their computer contains primary storage, including RAM.

Explain in detail another type of primary storage and why it is classed as such.

[4 marks]

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Question 5 continues on the next side

c) One day, the writer has so many programs open to the extent that their physical RAM cannot hold all of the data required to be kept.

How is the computer prevented from crashing?

[4 marks]

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d) Once the writer has finished writing their article, they go onto the cloud to upload their article.

What is the cloud?

[2 marks]

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Total marks for Question 5 are 18 marks

6 On a succession to comparing computers to others, the student now takes a look at a singular component of a PC, the CPU.

a) What does the term CPU stand for?

[1 mark]

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Question 6 continues on the next side

b) The MDR register stores data.
The MAR register stores an address.

What is the difference between storing data and storing an address?

[2 marks]

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c) Below is a list of registers inside the PC's CPU.

MAR
MDR
PC
IR

This PC follows the Von Neumann Architecture.
State one more register and it's purpose in the fetch-execute Cycle.

[3 marks]

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d) i. During benchmark, a students toy that has a strong magnet accidentally goes into contact with the Magnetic Harddisk drive and corrupts it's data.

The student needs a replacement secondary storage device.

Why does the student need secondary storage?

[3 marks]

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Question 6 continues on the next side

ii. The student then goes to a shop to buy a secondary storage.

There are three options:

Optical
Magnetic
Solid State

Which option should he choose? Explain your answer in detail.

Note: you cannot prove your point with what has been already said so far.

[5 marks]

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Question 6 continues on the next side

b) The student set's up their PC with the new secondary storage and installs the same benchmarking software used last time.

He chooses a set of benchmarks to download:

SuperRaceTest [20 MB]
Particles [1 GB]
Text rendering [32 B]
Workload Simulator [575 KB]

Calculate the total size amount of all these benchmark files in MB, show your working out.

[4 marks]

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c) The student opens a text editor document to note down his results, and he saves it in plain-text.

The textfile is encoded with 8 bits for each character, and 5000 total characters.

He takes a screenshot of the textfile, the image has a 256 possible colours for each pixel, has a width of 1000 pixels and a height of 700 pixels.

Calculate the size of the image in MB. Show your working out.

[3 marks]

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Question 6 continues on the next side

d) The student's download failed, and he realised he wasn't on an internet connection.

The student uses the operating system to setup a wireless connection.

Explain some functionalities in the operating system will help the user complete this task in succession.

[4 marks]

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Total marks for Question 6 are 25 marks

END OF PAPER
PAPER IS OUT OF 110 MARKS

This fake paper aimed to cover every possible topic, however, it didn't cover too well:

Cache
How data needs to be converted into a binary format to be processed by a computer [sound especially]
Shifting binary numbers
Definition of "Character set"
Sound
The need, effects of each compression
Roles of computers in p2p and client-server ??
Hardware such as NIC, Transmission media
Modes of connection to the internet
IP addressing, MAC addressing
Concept of layers
Forms of attack
Malware
Prevention Methods
Laws in relation to Computer Science

[bold, deemed hazardously important, and large is deemed even more important]

Do not write on this page

[unless you uhh.. idk uhhmmm, actually nvm just do it]